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JEL Codes: I10, J26

**Keywords: Preparation for old age; risk aversion; time preference; altruism;
expected longevity**



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Preparation for old age in France: The roles of preferences and expectations

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Working paper

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Abstract

This study takes a unified approach to assess the roles of preferences and expectations on preparation for old age in France. Our sample is representative of the customers of a large not-for-profit insurance company (“mutuelle”) and contains 1231 individuals aged 50 year and above. We use information on the general feeling to prepare for old age, specific preparation activities in various domains (e.g. the purchase of long-term care insurance or home adaptation), risk and time attitudes, family and social altruism, and expected disability and longevity. Half of the sample reports preparing for old age. Time preference emerges as an important predictor of preparation: indeed, making plans in general increases preparation for old age by 8.5 percentage points. Family altruism is positively associated with preparation in the finances and housing domains, whereas social altruism is not. While risk attitudes and altruism matter for preparation for old age, their effect may be less systematic across outcomes than that of time preference. Individuals who expect to become disabled or to live longer are more likely to prepare for old age. Policies promoting healthy aging should include messages targeting present-oriented individuals and try to make people more future-oriented.

Keywords: Preparation for old age; risk aversion; time preference; altruism; expected longevity.

JEL codes: I10, J26.

Highlights

- We investigate the roles of preferences and expectations on preparation for old age.
- The planning horizon emerges as an important predictor of preparation.
- Family altruism influences preparation in the finances and housing domains.
- Policies promoting healthy aging should target present-oriented individuals.

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1. Introduction

The increase of life expectancy in the world's wealthiest nations remains as one of the biggest policy challenge. A stream of initiatives to promote "aging well" has emerged as a response to this evolution (see for instance the French "Plan National "Bien Vieillir," 2007-2009"). These initiatives involve actions of local and national authorities, but also entail individual responsibility, to address the risks of later life such as low income, social isolation, poor health and disability (Street & Desai, 2011). At the individual level, response to a longer longevity requires preparation for old age in several domains (finances, housing, interpersonal relationships, health...). Because preparation for old age is critically important to well-being in later life (Adams & Rau, 2011; Noone, Stephens, & Alpass, 2009), a better understanding of the determinants of preparation at the individual level may open up new perspectives for policies promoting aging well.

There is a substantial literature in Gerontology and Psychology on "preparation for retirement" and in particular on financial planning of retirement. This strand of research demonstrates that preparation for retirement depends on personal tastes, and more specifically on risk and time attitudes (Adams & Rau, 2011; Dulebohn, 2002). However, the concept of "financial preparation for retirement" is narrower than that of "preparation for old age," because it solely focuses on the exit from the workforce, and exclusively emphasizes planning in the financial domain. In contrast, the literature in these fields on "preparation for old age" that takes a unified approach on preparation in several domains is limited (Denton et al., 2004; Kornadt & Rothermund, 2014).

As far as we are aware, there is no study on preparation for old age per se in Economics. However, some outcomes that can be considered as components of preparation for old age -- such as savings behaviors, the uptake of long-term care insurance, lifestyles and health -- are the subject of what is by now a very large literature. Risk and time preferences emerge as key predictors of these outcomes (Dohmen et al., 2011; Jusot & Khlal, 2013; Peretti-Watel, L'Haridon, & Seror, 2013; Van der Pol, 2011). A small number of studies also consider the role of preference with respect to family altruism (Fontaine, Plisson, & Zerrar, 2014).

Our objective is to investigate the roles of preferences and expectations on preparation for old age in France. Our data come from an original survey on the customers of Harmonie Mutuelle (HM), which is the French largest not-for-profit insurance company, and our final sample contains 1231 mid-life and older individuals. The data include information on the overall feeling to prepare for old age or not, and on a range of specific activities such as long-term care insurance purchase, home adaptation and efforts to maintain intellectual abilities and social ties. These specific outcomes pertain to several domains (finances, housing, social life and health) and relate to third-age preparation and / or fourth-age preparation. The survey also contains rich information on preferences (as defined in the economic literature), since we measure not only risk attitude and the planning horizon, but also family and social altruism. Regarding expectations, surveyed individuals indicate their expected disability and longevity. The data also provide information on myopia and denial regarding future potential disability.

We expect more risk-averse and future-oriented individuals to have a greater tendency to engage in preparation activities. In addition, more altruistic individuals, who internalize the negative impact of their non-preparation on their family and on the rest of society, should be more likely to prepare for old age. Compared with individuals who expect to become disabled,

persons who are myopic or in denial should be less likely to prepare for old age. Finally, expected longevity should be positively associated with preparation, because a greater expected longevity increases the payoff of preparation.

The contribution of our article is three-fold. First, we contribute to the small literature on preparation for old age (Denton et al., 2004; Kornadt & Rothermund, 2014). We focus on multiple specific aspects of preparation, which are generally not measured in a single survey. Second, we also extend the literature on the roles of preferences, that mainly focuses on the effect of risk and time preferences (Jusot & Khlal, 2013; Peretti-Watel et al., 2013; Van der Pol, 2011). Indeed, because we focus on preparation for old age that may be motivated by altruism and expectations regarding old age, we believe we should also consider the roles of family and social altruism, as well as disability and longevity expectations, in our models. Finally, we contribute to the literature on aging well for France. To our knowledge, there has been no study on the effect of preferences and expectations on preparation for France. A number of interesting articles using French data deal with the determinants of health in old age and of life expectancy (Cambois, Garrouste, & Pailhé, 2017; Cambois & Robine, 2011). We complement this literature by trying to improve the understanding of preparation for old age.

We find that risk aversion and the planning horizon are positively correlated with preparation. Moreover, family and social altruisms influence preparation, but in different domains: family altruism has an impact on preparation in the finances and housing domain whereas social altruism does not; and there is some suggestive evidence that the effect of social altruism on efforts to maintain intellectual skills is greater than that of family altruism. Importantly, compared with the other preferences measures, the impact of the planning horizon (in the general context) is more often significant across outcomes. Expected disability and longevity

are positively associated with preparation, while individuals who are either myopic or in denial are less likely to engage in preparation activities.

The rest of the article is organized as follows: the next section provides background on preparation for old age; Section 3 describes the data and the empirical specification; Section 4 contains our results; and Section 5 discusses the results and contains some concluding remarks.

2. Background

Preparation for retirement and savings behaviors

A sizable literature focuses on “preparation for retirement,” and in particular on financial planning of retirement (Adams & Rau, 2011). This is a narrower concept than that of “preparation for old age” in which we are interested here. Using data on 795 college and university employees in the US, an article shows that general risk propensity is positively correlated with employee’s risky investment behavior regarding retirement plans (Dulebohn, 2002). Another study finds that being more tolerant for risk in saving and investing increases the chances of financial preparation for retirement in the US (DeVaney & Chiremba, 2005).

Although they do not specifically focus on preparation for retirement or old age, some articles highlight the role of preferences in savings behaviors. In Germany, the willingness to take risks in general and the willingness to take risk in five contexts (car driving, financial matters, sports / leisure, career and health) are significantly associated with the probability of holding stocks, shares or stock options (Dohmen et al., 2011). For France, using the 1998-2011 waves of the « Patrimoine et préférences vis-à-vis du temps et du risque » (PATER) survey, an article shows

that risk and time preferences and expectations in the financial domain (regarding stock market performance) are associated with savings behavior, while family altruism is not (Arrondel & Masson, 2004).

Long-term care insurance purchase

Closely related to our article is a work on the role of preferences and expectations on the probability of buying long-term care insurance (“assurance dépendance”) in France (Fontaine et al., 2014). The data come from the 2011 wave of the PATER / PATED survey. The study focuses on four types of preferences -- time preference, risk preference, family altruism and the taste for informal help -- and on expected disability. Findings indicate that time preference is positively associated with the probability of expecting to become disabled. Moreover, risk aversion, family altruism and the taste of formal help are positively correlated with the likelihood of insurance uptake, while time preference is not.

Compared with these studies, our article focuses on preparation for old age across several domains and consider a broader set of preferences (that includes social altruism) as well as disability and longevity expectations.

Health and risky behaviors

The strand of literature on the effect of preferences and expectations on health and risky behaviors is also relevant to our study (Lawless, Drichoutis, & Nayga Jr, 2013). Using German data, a study finds a significant correlation between risk attitudes and physical activity (Dohmen et al., 2011). In the Netherlands, risk and time preferences are both associated with self-assessed

health (Van der Pol, 2011). In the US, risk aversion is correlated with smoking, heavy drinking, overweight and seat belt non-use (Anderson & Mellor, 2008); drinker drivers have greater rates of time preference, are more impulsive and are more likely to show hyperbolic discounting (Sloan et al. 2014a); and a higher risk aversion, lower time preference and greater expected longevity are positively associated with breast cancer screening (Picone et al. 2004). For France, using data from the 2008 French National Health, Health Care and Insurance Survey, an article finds that risk and time preferences are associated with current smoking (Jusot & Khlal, 2013). Employing data from a 2008 survey on 2000 French adults aged 18-75, a study explores the impact of time preferences (planning horizon and impulsivity) on smoking behaviors (Peretti-Watel et al., 2013). Some articles also focus on the role of preferences on breast cancer screening (Goldzahl, 2015) and sexual behaviors (Guillon, Fouéré, Segouin, & Simon, 2016) in France.

Unified approaches on preparation for old age

In contrast with the sizable literature that focuses on what can be considered as one specific aspect of preparation (such as savings behaviors or health), research that takes a unified approach on preparation for old age by focusing on several dimensions of preparation is limited. Using data on 51 mid-life and older Canadians, a qualitative study shows that planning for the future seems to be associated with taking a future-time perspective and having a sense of control over one's life (Denton et al., 2004). Compared with this study, our analysis employs a large sample of individuals and uses econometric techniques to assess the roles of demographic characteristics, preferences and expectations on planning, all other things being equal.

Using data on individuals aged 30-80 years from two middle-sized cities in Germany, an article assesses changes in preparation in nine domains (finances, emergencies and exceptional circumstances, mental and physical fitness, housing, looks and appearance, social relationships, health, leisure activities and lifestyle, and work and employment) across the life span, as well as the role of personality in preparation (Kornadt & Rothermund, 2014). Findings show that preparation for the third age mainly involves preparation in five domains while preparation for the fourth age relates to the four remaining domains. Personality traits influence either third- or fourth-age preparation. In contrast with this study, our article focuses on a range of specific preparation outcomes (like home adaptation and insurance uptake) instead of general domains, and pays attention to the role of preferences and expectations instead of personality traits.

Description of preparation for old age in France

Recent reports provide descriptive statistics about preparation for old age in France. A study shows that 76% of individuals above 70 years of age have prepared for old age in general. Regarding specific preparation activities, 82% tried to maintain connections with other people, 74% did checkups and became homeowners, and 67% hold precautionary savings (Viavoice, Harmonie_Mutuelle, France_2, & Le_Monde, 2013). Moreover, a survey on 1401 individuals living in Brest and aged 60 to 74 shows that a large fraction of people lives in houses that do not suit an older person's needs, but only 9% of individuals believe that they need to adapt their home for old age (CCAS de Brest 2013). We complement these findings by analyzing the determinants of preparation, among others.

3. Data and method

3.1. Survey

We use data from a survey that was carried out in 2016 among a sample of customers of HM. The sample is representative of the customers of HM along three criteria (gender, age group, and the type of insurance coverage i.e. individual vs. group insurance coverage). The data is unique in containing information on preparation for old age, preferences, expectations and socio-demographic characteristics. The data have been used to study subjective perceptions of aging well (B. H. Apouey, 2017). Our sample contains 1231 individuals above 50 years of age.

3.2. Preparation for old age

We first use information on general preparation for old age, that comes from the question: “To anticipate aging and prepare for old age, one may want to adapt her home, buy long-term care insurance, save money, be careful with her diet, do physical activity, etc. Do you think that you prepare, or have prepared, for old age (i.e. that you anticipate, or have anticipated, aging)?” We create a dummy for whether the answer is positive.

We complement this general piece of information with specific outcomes. The survey asks individuals whether:

- they save money for old age
- they have bought long-term care insurance (“assurance dépendance”)
- they are homeowners
- they have adapted their home for old age

- they try to maintain or develop social ties
- they are careful about their diet
- they do physical activity
- they try to maintain or develop intellectual skills.

Some of these preparation aspects have been studied in a recent report (Viavoice et al., 2013). We create a series of dummies for whether the individual does the activities. The activities relate to several domains of preparation: finances (savings and insurance uptake), housing (homeownership and home adaptation), social life (efforts to maintain social ties) and health (healthy diet, physical activity and efforts to maintain intellectual skills).

3.3. Preferences

Risk preferences

We focus on risk and time preferences as well as on family and social altruism. Our first measure of risk preferences is derived from the following question, in a Likert scale format: “On a scale from 0 to 10, do you think that in general you are prudent, you keep risks to a minimum (0), or, on the contrary, you like taking risks, you enjoy adventure and search for novelty and challenges (10)?” In our analysis, the score is reversed so that higher values indicate greater risk aversion.

Moreover, respondents’ attitude towards risk is measured by asking individuals whether they agree with a range of statements in the marriage and weather contexts. For instance, in the weather context, the statement is the following: “when you go out and the weather is unstable,

you try to protect yourself from rain (raincoat, umbrella).” The attitude variables go from 0 (“never”) to 3 (“often”).

Time preferences

Our first variable is a Likert scale that captures the general planning horizon. This is derived from the following question: “On a scale from 0 to 10, do you think that you live your life day by day (0) or, on the contrary, that you are farsighted (10)?”

Second, respondents’ time attitudes are measured by asking individuals whether they agree with a range of statements. In particular, we use the following statement that capture attitude in general: “you are the kind of person who makes plans.” The questionnaire also contains statements belonging to the leisure and old age contexts. In the leisure context, the statement is the following: “in general, you prepare for your holidays in advance” whereas in the old age context, we employ the following statement: “you are worried about ending up in a nursing home.” The attitudes variables go from 0 (“not at all”) to 3 (“yes exactly”).

Family altruism

For family altruism, we only have information on attitudes which are collected by asking individuals whether they agree with a series of statements. One of these statements is the following: “On a scale from 0 to 10, do you think that “leaving an inheritance for your descendants” is not an important reason at all to save money (0) or, on the contrary, is a very good reason to save money (10)?” This variable is also used to capture family altruism in Fontaine et al. (2014). Except from this variable, the rest of our family altruism attitudes

variables range from 0 (not altruistic) to 3 (altruistic). Note that the questions on attitudes related to risk, time and family altruism come from the PATER questionnaire (Arrondel and Masson, 2004).

Social altruism

To measure social altruism, we first use responses to this question in a Likert scale format: “On a scale from 0 to 10, beyond your family, do you think that you are rather egoistic, or on the contrary altruistic (10)?” This is an original question we developed for our survey.

Moreover, respondents’ social altruism is also quantified by asking respondents whether they agree with some statements borrowed from a previous study (Büssing, Kerksieck, Günther, & Baumann, 2013). For instance, one of the statements is the following: “I help others even when there is no direct benefit to me.” Options for answers are: “never,” “rarely,” “sometimes” and “often.” The variables are created by coding the response items from 0 (“never”) to 3 (“often”).

We standardize our preferences variables, so that their mean equals zero and their standard deviation equals one. We report results using standardized and non-standardized variables.

3.4. Expected disability and longevity, myopia and denial

On expected disability, the survey asks: “Do you think that you could become disabled one day?” Options for answers are “yes,” “no” and “I do not want to talk about that.” The first option corresponds to expected disability, the second to myopia and the third to denial (Fontaine et al., 2014). We create three dummy variables and use potential disability as our reference

category. A similar question can be found in the 2011 PATER / PATED survey (Fontaine et al., 2014).

To elicit the person's assessment of her life expectancy, respondents are asked the following series of questions: "Do you think that you will live longer than 70 years? ...80 years? ... 90 years? ... 100 years?" The questions could be answered in the positive or in the negative. Because very few individuals believe that they will live less than 70 years or more than 100 years, we create three binary indicators for whether the individual thinks he will live less than 80 years (reference), between 80 and 90 years, and more than 90 years.

Additional details about the variables of interest are provided in Appendix A.

3.5. Control variables

Our models include control variables for gender, age, marital status (marital life or not), education (less than "baccalauréat" (reference category); "baccalauréat" graduate; more than "baccalauréat"), the logarithm of income and labor market status (employed (reference); retired; unemployed or not in the labor force (NLF) but not retired).

When an explanatory variable (like income) has more than 75 observations with missing values, we create a dummy variable for whether information is missing and include it in our models.

3.6. Method and empirical issues

We are interested in the effect of preferences and expectations on preparation choices. Following economic theory, preferences should be exogenous in our models. In contrast, expectations may be endogenous. Indeed, the correlation between expectations and preparation may not only capture the causal effect of expectations on preparation that we are interested in, but also reverse causation running from preparation to expectations, or the omission of third common hidden factors. First, it is entirely possible that preparation influence expectations. For example, some individuals may have started preparing for old age a long time before the interview; as a result, they may be healthier by the time of the interview, and so that they may be less likely to expect to become disabled and they may report a longer longevity. In our approach, we cannot disentangle causation running from expectations to preparation from reverse causation running from preparation to expectations. Second, there may be common hidden factors that influence both expectations and preparation and create a spurious correlation between them. We account for this potential bias by including preferences variables. We estimate our regressions using linear probability models.

4. Results

4.1. Descriptive analysis

Descriptive statistics for the variables of interest are presented in Table 1. In our sample, half individuals (50%) consider that they prepare for old age. 15% declare that they have bought insurance and 31% adapted their home. Lifestyles seem rather healthy: 83% report being careful

about diet, more than 61% do physical activity and 82% try to maintain or develop intellectual abilities.

The average individual is risk averse, future oriented and altruistic. Indeed, preferences scores are all greater than their middle categories -- for instance, on a scale from 0 to 10 (the middle equals 5.5), the level of risk aversion equals 5.86. Approximately two third of the sample think they could become disabled (67%), and the rest is equally divided between myopia (17%) and denial (15%). Finally, half of the individuals (51%) expect to live between 80 and 90 years.

[Insert Table 1 here]

Regarding the evolution of preparation with age, we generally find that preparation strengthens with age, at least for the younger age groups (see Appendix B).

4.2. Main regression analysis

We first estimate the correlation between preferences, expectations and preparation, using the following preferences measures: the Likert scale for risk aversion and the variables for whether the individual makes plans (to capture the planning horizon), thinks that giving money to her children is a good reason to save money (to capture family altruism) and helps others even when there is no direct benefit to her (to capture social altruism). The results are presented in Table 2. Males are less likely to prepare for old age (home adaptation, maintaining social ties and intellectual abilities, and being careful about diet) than females. For instance, the probability of home adaptation is 5.6 percentage points lower for males, that of being careful with diet, 12.1 points lower, and that of trying to maintain intellectual skills, 10.0 points lower. Moreover, for

a number of outcomes, preparation increases with age (general preparation, savings, insurance, home adaptation and diet).

In general, a higher socioeconomic status strengthens preparation activities: income is positively associated with general preparation, homeownership, efforts to maintain social ties and physical activity, while education is positively associated with homeownership, a healthy diet, physical activity and efforts to maintain intellectual skills. Note however that education is negatively correlated with general preparation and home adaptation (more educated individuals may already live in houses that are well suited for old age). Retirement increases the likelihood of doing physical activity.

The Likert scale for risk aversion is not associated with our preparation outcomes. Regarding time preferences, making plans is a robust predictor of preparation for old age, since it is positively and significantly associated with eight outcomes out of nine. Moreover, its effect is large: when this explanatory variable increases by 1, the probability of preparing for old age in general increases by 8.5 percentage points, i.e. by 16.73% ($100 \cdot 8.5 / 50.79 = 16.73$) (see unstandardized results). In other words, when the time variable increases by one standard deviation, general preparation increases by 7.20 percentage points, i.e. 14.17% ($100 \cdot 7.20 / 50.79 = 14.17$) (see standardized results in brackets). In contrast, there is no evidence that time preferences matter for buying insurance.

Family altruism has a positive effect on general preparation, savings behaviors, insurance uptake and efforts to maintain intellectual skills. The effect of family altruism on financial outcomes (savings behaviors, insurance uptake) seem large. There is suggestive evidence that the effect of family altruism on general preparation is smaller than that of the planning horizon:

when family altruism increases by one standard deviation, general preparation only increases by 3.80 percentage points. Similarly, there is suggestive evidence that the impact of family altruism on efforts to maintain intellectual skills is smaller than that of time preference.

Social altruism is positively associated with general preparation, efforts to maintain social ties and intellectual skills, and a healthy diet. Unlike family altruism, social altruism is not correlated with preparation in the finances and housing domains. Again, there is suggestive evidence that the effect of social altruism on general preparation is smaller than that of the planning horizon: when social altruism increases by one standard deviation, general preparation only increases by 2.50 percentage points (*vs.* 7.20 for the planning horizon). In contrast, there is also some suggestive evidence that the impact of social altruism on efforts to maintain intellectual skills is larger than that of the planning horizon or of family altruism.

Regarding the roles of expectations, myopia and denial, we find that compared to individuals who think they could become disabled in the future, myopic individuals are less likely to prepare for old age (general preparation, savings behaviors, insurance uptake, home adaptation and social ties). These effects are economically significant: in particular, myopia decreases the likelihood of preparing for old age in general by 11.3 percentage points, *i.e.* by 22.24% ($100 * 11.3 / 50.79 = 22.24$), that of saving money for old age by 29.32% ($100 * 14.4 / 49.10 = 29.32$), and that of adapting home by 37.44% ($100 * 11.8 / 31.51 = 37.44$). For most outcomes, being in denial also decreases the likelihood of preparation: for instance, denial decreases the likelihood of preparing for old age in general by 13.4 percentage points.

Findings on the role of expected longevity make sense: expected longevity is positively associated with preparation activities in general and in the financial, housing and health

domains. The probability that an individual who expects to live between 80 and 90 years prepares for old age in general is 10.4 percentage points higher than that of an individual who expects to live less than 80 years. For individuals who expect to live more than 90 years, the effect is even greater. However, there is no evidence that expected longevity has any effect on efforts to maintain social ties and intellectual skills.

[Insert Table 2 here]

4.3. Regression analysis using alternative measures for preferences

We check the robustness of our findings by re-estimating our models using alternative preferences variables (Likert scales and attitudes). The results are presented in Table 3. When we use Likert scales in Panel A, the results support our previous findings that time preference is correlated with most outcomes, and there is suggestive evidence that time preference often has a greater impact on preparation than risk preference or family altruism (not for social ties though).

The results using attitudes variables are presented in Panel B. The risk and time attitudes pertain to several contexts: marriage, weather and old age (for risk attitudes), and general, leisure and old age (for time attitudes). Risk and time attitudes in these contexts are significantly associated with preparation. More precisely, risk attitudes in the marriage and weather contexts are significantly linked to preparation in general. This finding is in stark contrast to the absence of correlation between risk aversion (measured using the Likert scale) and general preparation. Time attitude in the leisure context is also significantly associated with preparation in general. Time attitude in the old age context (i.e. being worried about ending up in a nursing home) is

significantly associated with financial preparation. Some family altruism attitudes measures are positively correlated with preparation in the finances and housing domains, while social altruism variables are not. Finally, the variables capturing social altruism attitudes are systematically correlated with efforts to maintain intellectual skills.

[Insert Table 3 here]

5. Discussion and conclusion

Using original data from a “mutuelle,” this paper takes a unified approach to study the roles of preferences and expectations on preparation for old age in France. While 67% of individuals think they could become disabled in the future, only half of individuals (50%) say that they engage in preparation behaviors. General preparation strengthens with age: 38% of individuals say they prepare at ages 50-59, but 66% at ages 70-84. The increase in preparation could come from the increase in the probability of needing preparation as individuals grow older. Regarding specific preparation outcomes, we find that some choices or activities are rather rare, like the uptake of an insurance or home adaptation, while other are very frequent, like homeownership, efforts to maintain social ties and intellectual abilities and a healthy diet.

Females are more likely than males to prepare for old age in the housing, social-life and health domains. Such a gender gap has already been highlighted for preparation for retirement (Petkoska & Earl, 2009). In the social relationships domain, the gap between females and males may reflect the differential socialization of females and males, which emphasizes social skills for females. The gender gap in health-related behaviors is consistent with the common findings that women are more likely to adopt a positive health behavior (Lundborg & Andersson, 2008).

There is no difference between females and males regarding financial preparation (savings, insurance), which is also consistent with some previous findings (Petkoska & Earl, 2009). Our study also shows that individuals who are in a relationship are more likely to engage in preparation for old age, which is in line with previous findings (Denton et al., 2004).

Our article provides some explanations for the relatively low rate of general preparation for old age. There are several potential reasons why half of individuals do not prepare for old age: low income, high cost of preparation, great risk and time preference, selfishness, low subjective probability of becoming disabled and a short expected longevity. First, we find a positive association between income and preparation of old age. This finding is similar to previous evidence: for instance, a higher income is associated with reflexive planning for later life in Canada (Denton et al., 2004). More generally, the positive link between income and preparation is consistent with social inequalities in morbidity and mortality in old age (B. Apouey, 2010; B. H. Apouey, 2015). Assuming that income captures the unobserved cost of preparation, our finding also implies that the cost of preparation may be a barrier to preparation.

High risk preference also partially explains non-preparation. This is in line with other studies on the role of risk preference on lifestyles and risky behaviors (Barsky, Kimball, Juster, & Shapiro, 1997).

Family and social altruism matter for preparation of old age, or, equivalently, selfishness increases the odds of non-preparation. Both types of altruism play a positive role in preparation in general, efforts to maintain social ties and healthy eating habits. However we find that family altruism and social altruism do not influence the same activities: family altruism is positively linked to preparation in the finances and housing domain (savings behaviors, insurance uptake,

homeownership and home adaptation) whereas social altruism is not; and the effect of social altruism on efforts to maintain intellectual skills is more systematic than that of family altruism.

We find that more future-oriented individuals are more likely to prepare for old age, consistent with previous results for Canada (Denton et al., 2004). Symmetrically, high time preference is a robust predictor of non-preparation. The role of time preference (in the general context) on general preparation is more systematic across outcomes than that of the other preferences variables, and there is suggestive evidence that the effect of time preference is generally greater than that of risk aversion or altruism.

Individuals who think they will become disabled in the future are more likely to engage in preparation for old age, like individuals who expect to live longer. In contrast, myopia, denial and a short expected longevity increase the likelihood of non-preparation. However the interpretation of the correlation between expectations and preparation is subject to debate, as it does not necessarily reflect the causal influence of expectations on preparation.

Our results have implications for the design of policies promoting healthy aging. Indeed, the findings on the gender gap in preparation suggest that intervention programs that meet the specific needs of females and males are needed. Second, since non-preparation is strongly associated with lack of self-control due to preference for the present, campaigns should either include messages targeting present-oriented individuals or try to make people adopt more future-oriented behavior.

We acknowledge some weaknesses on our study, mostly due to data limitations. First, our sample was not designed to be representative of the entire French population, but of the

customers of a large insurance company. In particular, compared with the French population of the same age group, the average individual in our sample is more likely to be married and to be a homeowner. For this reason, our results should be interpreted with some caution and further research should check whether our findings can be replicated for a nationally representative sample. A second limitation of our study is related to our preferences measures. Indeed, we use a limited number of variables to measure preferences (Likert scales and some attitudes variables). Additional variables have been developed to measure risk and time preferences (Barsky et al., 1997; Holt & Laury, 2002; Lawless et al., 2013; Strathman, Gleicher, Boninger, & Edwards, 1994) and should be used to check the robustness of our results. On a related matter, due to data limitation, our study does not examine the role of time inconsistent preferences on preparation.

In closing, individuals are increasingly responsible to prepare for old age. In spite of this, limited research has explored the factors influencing this preparation. Our article takes a unified approach to assess the role of preferences and expectations on multiple aspects of preparation. Findings indicate that not only do risk and time preferences matter, but family and social altruism also play a significant role. Among preferences characteristics, time preference seems to have a more systematic effect than the other types of preferences. Moreover, expected disability and longevity also correlate with preparation. Preferences and expectations represent an important ingredient in the design of effective programs promoting successful aging.

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TABLES

Table 1. Descriptive statistics

Variable	Min-max	Proportion or mean (standard error)
<i><u>Preparation for old age</u></i>		
General preparation	0-1	50.79%
Savings	0-1	49.10%
Insurance	0-1	15.87%
Homeowner	0-1	79.58%
Home adaptation	0-1	31.51%
Social ties	0-1	74.72%
Diet	0-1	83.94%
Physical activity	0-1	61.90%
Intellectual skills	0-1	82.54%
<i><u>Preferences</u></i>		
Risk - General context - Risk aversion (Likert)	0-10	5.86 (2.48)
Time - General context - Planning horizon (Likert)	0-10	7.06 (2.24)
Time - General context - Is the kind of person who makes plans	0-3	1.72 (0.86)
Family altruism - Thinks that giving money to children is an important reason to save money	0-10	6.13 (2.67)
Social altruism - Social altruism (Likert)	0-10	6.78 (2.10)
Social altruism - Helps others when there is no direct benefit for her	0-3	2.13 (0.76)
<i><u>Expectations, myopia and denial</u></i>		
Expected disability. Reference	0-1	67.01%
Myopia	0-1	17.50%
Denial	0-1	15.47%
Expected longevity < 80. Reference	0-1	21.21%
Expected longevity 80-90	0-1	51.54%
Expected longevity > 90	0-1	27.25%

Notes. Standard errors for continuous variables are reported in parentheses.

Table 2. Main model

	(1) General preparation	(2) Savings	(3) Insu- rance	(4) Home- owner	(5) Home adaptation	(6) Social ties	(7) Diet	(8) Physical activity	(9) Intellectual skills
Male	-0.008	0.017	-0.011	-0.010	-0.056**	-0.061**	-	-0.039	-0.100***
	(0.029)	(0.032)	(0.025)	(0.022)	(0.027)	(0.025)	0.121***	(0.028)	(0.022)
Age 60-69	0.109*	0.107*	0.089*	0.069*	0.112**	0.047	0.111***	0.044	0.063
	(0.059)	(0.063)	(0.048)	(0.042)	(0.052)	(0.051)	(0.036)	(0.056)	(0.043)
Age 70+	0.226***	0.172**	0.187***	0.069	0.221***	0.077	0.093**	-0.053	0.070
	(0.068)	(0.073)	(0.057)	(0.049)	(0.061)	(0.057)	(0.041)	(0.063)	(0.048)
Living alone	-0.019	-0.107***	0.011	-0.175***	-0.064**	0.027	-0.044*	-0.019	-0.021
	(0.033)	(0.037)	(0.028)	(0.030)	(0.030)	(0.029)	(0.024)	(0.032)	(0.025)
Medium edu	-0.003	0.032	0.005	0.044	-0.014	0.039	0.040	0.099***	0.030
	(0.037)	(0.041)	(0.032)	(0.027)	(0.036)	(0.033)	(0.026)	(0.037)	(0.028)
High edu	-0.077**	-0.017	-0.041	0.045*	-0.092***	0.002	0.054**	0.155***	0.047*
	(0.037)	(0.042)	(0.029)	(0.026)	(0.034)	(0.031)	(0.024)	(0.034)	(0.025)
Retired	0.050	-0.047	-0.020	-0.017	0.022	0.013	0.029	0.108*	0.038
	(0.061)	(0.065)	(0.050)	(0.043)	(0.053)	(0.052)	(0.035)	(0.056)	(0.043)
Unemployed or NLF	0.026	0.052	-0.023	0.020	0.064	-0.058	-0.011	0.109*	0.082*
	(0.055)	(0.061)	(0.038)	(0.047)	(0.052)	(0.054)	(0.049)	(0.057)	(0.043)
Ln(income+1)	0.024*	0.031	-0.007	0.073***	-0.005	0.034**	-0.001	0.045***	0.025
	(0.014)	(0.021)	(0.010)	(0.022)	(0.017)	(0.014)	(0.013)	(0.016)	(0.016)
Risk aversion (Likert)	0.008	0.010	-0.001	-0.000	0.006	-0.000	-0.001	-0.004	-0.001
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.006)	(0.004)
	[0.019]	[0.025]	[-0.004]	[-0.001]	[0.014]	[-0.000]	[-0.002]	[-0.010]	[-0.001]
	[[0.014]]	[[0.015]]	[[0.011]]	[[0.011]]	[[0.013]]	[[0.013]]	[[0.010]]	[[0.013]]	[[0.010]]
Time - Makes plans	0.085***	0.060***	0.007	0.069***	0.057***	0.081***	0.029**	0.105***	0.038***
	(0.017)	(0.018)	(0.014)	(0.014)	(0.016)	(0.015)	(0.013)	(0.016)	(0.013)
	[[0.072***]]	[[0.050***]]	[[0.006]]	[[0.059***]]	[[0.048***]]	[[0.069***]]	[[0.024**]]	[[0.089***]]	[[0.032***]]
	[[0.014]]	[[0.016]]	[[0.011]]	[[0.012]]	[[0.013]]	[[0.013]]	[[0.011]]	[[0.014]]	[[0.011]]
Family altruism - Giving money to children	0.014***	0.023***	0.009**	0.006	-0.002	0.008	-0.002	-0.002	0.008**
	(0.005)	(0.006)	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)
	[[0.038***]]	[[0.059***]]	[[0.024**]]	[[0.016]]	[[0.006]]	[[0.022]]	[[0.005]]	[[0.007]]	[[0.021**]]
	[[0.014]]	[[0.015]]	[[0.011]]	[[0.012]]	[[0.013]]	[[0.014]]	[[0.010]]	[[0.014]]	[[0.011]]
Social altruism - Helps others	0.033*	-0.024	-0.003	-0.007	0.003	0.070***	0.024*	0.028	0.051***
	(0.019)	(0.020)	(0.016)	(0.015)	(0.018)	(0.017)	(0.014)	(0.018)	(0.015)
	[[0.025*]]	[[0.018]]	[[0.002]]	[[0.005]]	[[0.002]]	[[0.053***]]	[[0.019*]]	[[0.021]]	[[0.039***]]
	[[0.014]]	[[0.016]]	[[0.012]]	[[0.012]]	[[0.014]]	[[0.013]]	[[0.011]]	[[0.014]]	[[0.011]]
Myopia	-0.113***	-0.144***	-0.051*	-0.030	-0.118***	-0.068*	-0.009	0.002	0.024
	(0.038)	(0.041)	(0.028)	(0.030)	(0.033)	(0.035)	(0.029)	(0.037)	(0.028)
Denial	-0.134***	-0.050	-	-0.061*	-0.180***	-0.051	-0.035	-0.013	-0.087**
	(0.039)	(0.044)	0.082***	(0.033)	(0.033)	(0.036)	(0.031)	(0.039)	(0.034)
Longevity 80-90	0.104**	0.118**	0.024	0.061*	0.080**	-0.037	0.091**	0.057	-0.025
	(0.042)	(0.046)	(0.032)	(0.036)	(0.037)	(0.038)	(0.035)	(0.042)	(0.032)
Longevity >90	0.148***	0.126**	0.091**	0.069*	0.096**	-0.008	0.099***	0.127***	-0.001
	(0.047)	(0.052)	(0.038)	(0.040)	(0.042)	(0.041)	(0.037)	(0.046)	(0.036)
Observations	1,172	1,027	1,016	1,219	1,197	1,223	1,231	1,227	1,228

Notes. Dummies for missing information on income and family altruism are included. Coefficients and standard deviations on standardized variables (i.e. with a mean of 0 and a standard deviation of 1) are shown in brackets. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 3. Results using alternative measures of preferences

	(1) General preparation	(2) Savings	(3) Insu- rance	(4) Home- owner	(5) Home adaptation	(6) Social ties	(7) Diet	(8) Physical activity	(9) Intellectual skills
Panel A. Likert scales									
Risk aversion (Likert)	0.004 (0.006) [0.010] [(0.014)]	0.008 (0.006) [0.018] [(0.015)]	-0.002 (0.005) [-0.005] [(0.012)]	-0.002 (0.005) [-0.005] [(0.011)]	0.004 (0.005) [0.009] [(0.013)]	-0.004 (0.005) [-0.011] [(0.013)]	-0.001 (0.004) [-0.003] [(0.010)]	-0.007 (0.006) [-0.017] [(0.014)]	-0.003 (0.004) [-0.008] [(0.010)]
Time - Planning horizon (Likert)	0.043*** (0.006) [0.094***] [(0.014)]	0.046*** (0.007) [0.101***] [(0.016)]	0.011** (0.005) [0.023**] [(0.010)]	0.018*** (0.006) [0.040***] [(0.013)]	0.013** (0.006) [0.028**] [(0.013)]	0.005 (0.006) [0.012] [(0.013)]	0.020*** (0.005) [0.045***] [(0.012)]	0.007 (0.006) [0.016] [(0.014)]	0.011** (0.005) [0.025**] [(0.012)]
Social altruism (Likert)	-0.008 (0.007) [-0.016] [(0.015)]	-0.008 (0.007) [-0.017] [(0.015)]	-0.007 (0.005) [-0.015] [(0.011)]	-0.012** (0.006) [-0.024**] [(0.012)]	-0.003 (0.006) [-0.006] [(0.013)]	0.026*** (0.006) [0.053***] [(0.013)]	0.004 (0.005) [0.009] [(0.010)]	-0.009 (0.007) [-0.018] [(0.014)]	0.004 (0.005) [0.008] [(0.011)]
Panel B. Attitudes									
<i>Risk</i>									
Marriage context - Thinks that homogamy increases the length of a couple relationship	0.077*** (0.024)	0.040 (0.027)	0.043** (0.019)	0.049** (0.019)	-0.004 (0.023)	0.012 (0.022)	0.012 (0.018)	0.055** (0.024)	0.008 (0.019)
Marriage context - Believes that marriage is a security	0.048*** (0.015)	0.049*** (0.017)	-0.000 (0.012)	0.028** (0.012)	0.047*** (0.014)	0.021 (0.014)	0.001 (0.011)	0.027* (0.015)	-0.004 (0.012)
Weather context - Takes precautions against an uncertain weather	0.064*** (0.018)	0.049** (0.019)	0.009 (0.014)	0.003 (0.015)	0.020 (0.016)	0.040** (0.017)	0.029** (0.014)	0.034** (0.017)	0.037*** (0.014)
<i>Time</i>									
General context - Is the kind of person who makes plans	0.090*** (0.017)	0.063*** (0.018)	0.013 (0.013)	0.070*** (0.014)	0.056*** (0.016)	0.090*** (0.015)	0.030** (0.012)	0.105*** (0.016)	0.052*** (0.013)
Leisure context - Prepares for her holidays in advance	0.060*** (0.015)	0.054*** (0.016)	0.022* (0.012)	0.003 (0.012)	0.016 (0.014)	0.020 (0.014)	0.014 (0.011)	0.042*** (0.015)	0.016 (0.011)
Old age context - Is worried about ending up in a nursing home	0.003 (0.014)	0.044*** (0.015)	0.021* (0.011)	0.016 (0.012)	0.015 (0.012)	0.019 (0.013)	0.005 (0.010)	-0.009 (0.014)	0.012 (0.011)
<i>Family altruism</i>									
Thinks that giving money to children is an important reason to save money	0.062*** (0.018)	0.085*** (0.019)	0.031** (0.013)	0.027* (0.014)	-0.002 (0.016)	0.040** (0.017)	0.000 (0.013)	0.009 (0.017)	0.032** (0.014)
Believes that parents should try to leave their children an inheritance	0.046*** (0.017)	0.066*** (0.018)	0.022* (0.013)	0.029** (0.013)	0.007 (0.015)	0.015 (0.015)	0.005 (0.012)	0.022 (0.016)	0.000 (0.012)
Teaches her children a sense of family	0.040* (0.023)	0.017 (0.025)	-0.010 (0.018)	-0.008 (0.018)	0.049** (0.020)	0.103*** (0.020)	0.040** (0.017)	-0.048** (0.022)	-0.004 (0.016)
Believes that having children is a lifelong engagement	-0.021 (0.021)	0.074*** (0.023)	-0.014 (0.017)	0.014 (0.017)	0.015 (0.018)	0.038* (0.019)	0.038** (0.017)	0.000 (0.020)	0.010 (0.017)
<i>Social altruism</i>									
Helps others when there is no direct benefit for her	0.045** (0.019)	-0.014 (0.020)	0.002 (0.015)	-0.001 (0.015)	0.004 (0.018)	0.085*** (0.017)	0.028** (0.014)	0.039** (0.018)	0.060*** (0.015)
Helps someone she does not know who asks for help	-0.006 (0.017)	-0.017 (0.018)	-0.031** (0.014)	-0.001 (0.014)	-0.026* (0.016)	0.037** (0.015)	0.003 (0.011)	0.019 (0.016)	0.036*** (0.013)
Thinks about how to relieve the	0.044** (0.018)	0.033 (0.020)	-0.013 (0.016)	0.013 (0.014)	0.015 (0.017)	0.066*** (0.017)	0.024* (0.013)	0.020 (0.018)	0.051*** (0.015)

distress of individuals in need									
Can relinquish her material good in favor of the common good	-0.026 (0.016)	0.006 (0.017)	-0.013 (0.012)	0.003 (0.012)	-0.005 (0.015)	0.076*** (0.014)	0.008 (0.011)	0.012 (0.015)	0.031** (0.012)

Notes. Controls for socio-demographic characteristics and expectations are included. In Panel B, we do not control for the other types of preferences. Coefficients and standard deviations on standardized variables (i.e. with a mean of 0 and a standard deviation of 1) are shown in brackets. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

NOT FOR PUBLICATION

Appendix A. Definitions of the variables of interest

Table A1. Definitions of the main variables

Variable label	Definition	Survey question in French
<i>Preparation for old age</i>		
General preparation	=1 if she prepares or prepared for old age	Pour anticiper son vieillissement et préparer ses « vieux jours », une personne peut par exemple adapter son logement (salle de bain aménagée, ...), souscrire à un contrat d'assurance dépendance, mettre spécialement de l'argent de côté, surveiller spécialement son alimentation, pratiquer spécialement une activité physique, etc. Avez-vous le sentiment de préparer, ou d'avoir préparé, vos « vieux jours » (d'anticiper, ou d'avoir anticipé, votre vieillissement) ? Oui tout à fait / Oui plutôt / Non plutôt pas / Non pas du tout
Savings	=1 if she saved money	Mettez-vous de l'argent de côté, spécialement pour vos « vieux jours » (votre vieillissement) ? Oui / Non
Insurance	=1 if she bought a long-term care insurance	Avez-vous souscrit à un contrat d'assurance dépendance ? Oui / Non
Homeowner	=1 if she is a homeowner	Etes-vous propriétaire d'un logement ? Oui / Non
Home adaptation	=1 if she adapted her home	Avez-vous adapté votre logement (salle de bain aménagée, rampe d'escalier adaptée...) spécialement pour préparer vos « vieux jours » (anticiper votre vieillissement) ? Oui / Non
Social ties	=1 if she tries to maintain or develop social ties	Cherchez-vous à maintenir ou développer un lien social avec des gens ? Oui / Non
Diet	=1 if she is careful about diet	Faites-vous attention à votre alimentation ? Oui / Non
Physical activity	=1 if does physical activity	Pratiquez-vous une activité physique ? Oui / Non
Intellectual skills	=1 if she tries to maintain or develop intellectual abilities	Cherchez-vous à maintenir ou à développer vos capacités intellectuelles ? Oui / Non
<i>Preferences</i>		
<i>Risk preferences</i>		
Risk - General context - Risk aversion (Likert)	Score from 0 to 10	Sur une échelle de 0 à 10, vous considérez-vous de manière générale comme quelqu'un de prudent(e), limitant au maximum les risques, ou inversement comme quelqu'un qui aime prendre des risques, qui aime l'aventure et recherche la nouveauté et les défis ? Echelle de 0 à 10
<i>Time preferences</i>		
Time - General context - Planning horizon (Likert)	Score from 0 to 10	Sur une échelle de 0 à 10, vous considérez-vous plutôt comme quelqu'un vivant au jour le jour, ou inversement comme quelqu'un qui pense à l'avenir et qui est prévoyant(e) ? Echelle de 0 à 10
Time - General context - Is the kind of person who makes plans	Score from 0 (Not at all) to 3 (Yes, always)	Vous êtes quelqu'un qui fait des projets. Non, pas du tout / Non, plutôt pas / Oui, plutôt / Oui, tout à fait
<i>Family altruism</i>		
Family altruism - Thinks that giving money to children is an important reason to save money	Score from 0 to 10	Sur une échelle de 0 à 10, considérez-vous que « transmettre à vos descendants » est une raison d'épargner pas du tout importante, ou inversement très importante ? Echelle de 0 à 10
<i>Social altruism</i>		

Social altruism (Likert)	Score from 0 to 10	Sur une échelle de 0 à 10, au-delà de votre cercle familial, vous considérez-vous plutôt comme quelqu'un d'égoïste, ou inversement comme quelqu'un d'altruïste ? Echelle de 0 à 10
Social altruism - Helps others when there is no direct benefit for her	Score from 0 (Never) to 3 (Often)	Vous aidez autrui même quand cela ne vous rapporte rien personnellement. Jamais / Rarement / Parfois / Souvent
<i>Expectations, myopia and denial</i>		
Expected disability	=1 if she thinks she could become disabled	Vous-mêmes, avez-vous envisagé qu'un jour vous pourriez devenir dépendant ? Oui / Non / Vous ne souhaitez pas en entendre parler
Myopia	= 1 if she does not think she could become disabled. Reference category	
Denial	=1 if she does not want to talk about disability	
Expected longevity < 80	=1 if she believes that her longevity is less than 80 years	Pensez-vous que vous allez vivre au-delà de : (i) 70 ans ? (ii) 80 ans ? (iii) 90 ans ? (iv) 100 ans ? Oui / Non
Expected longevity 80-90	=1 if she believes that her longevity is between 80 and 90 years	
Expected longevity > 90	=1 if she believes that her longevity is greater than 90 years	

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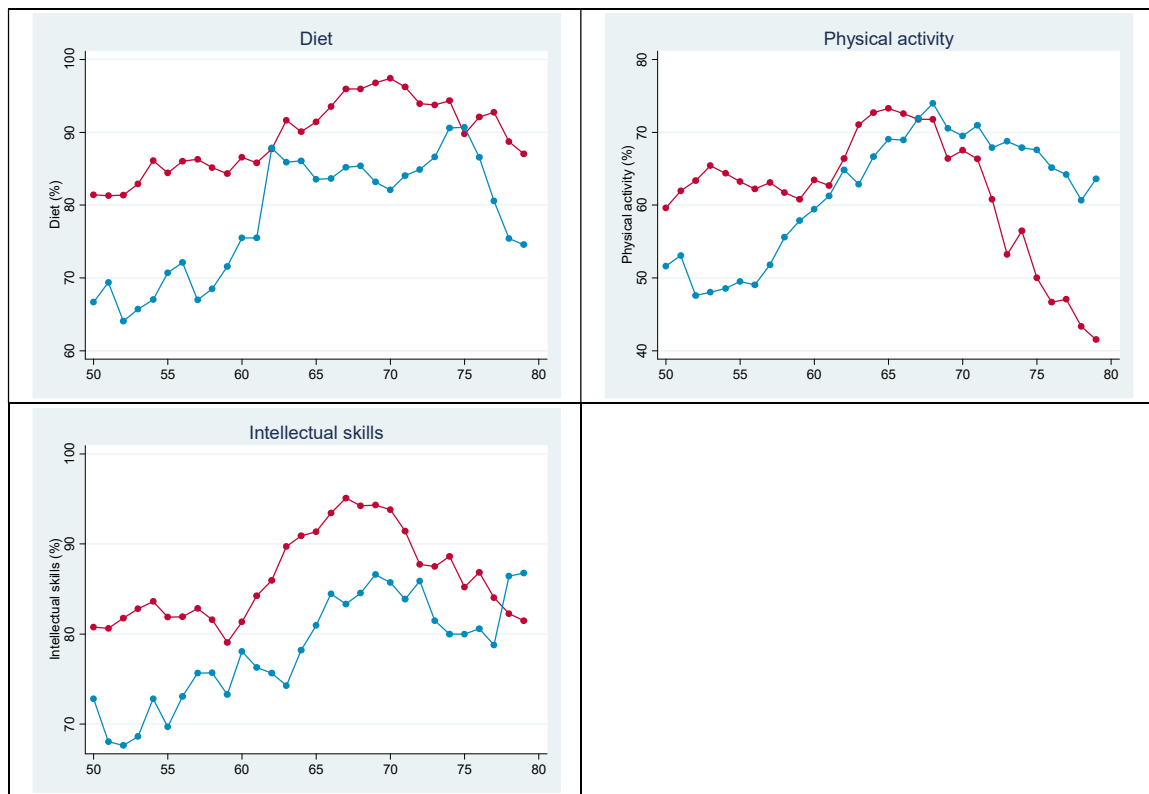
Appendix B

In the graphs below, a dot at age “x” represents the average preparation rate for individuals aged “x-2” to “x+2”. For example, a dot at age 50 represents the average preparation level for individuals aged 48 to 52.

Descriptive statistics by age and gender



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Regarding the evolution of preparation with age, we generally find that preparation strengthens with age, at least for the younger age groups. Indeed, the general preparation variable increases for females while it increases and then becomes stable (or decreases) around age 70 for males. Among females, 35% report that they prepare for old age at ages 48-52, versus 54% at ages 63-67 and 65% at ages 73-77. The figures for males are respectively 26%, 49% and 72%.

Moreover, we find that the probability of insurance uptake (for females) and home adaptation (females) significantly increases with age. In addition, for some other outcomes, preparation increases and then remains stable: this is true for savings behaviors (females and males), insurance uptake (males), homeownership (males), home adaptation (males), social ties (females), diet (females and males) and physical activity (males). Homeownership (females) increases and then decreases with age, while efforts to maintain intellectual skills (females) first remain stable, then increase and finally decrease with age.

However, for the remaining outcomes, we do not find any evidence of an increase with age, even for younger individuals: physical activity (females) remains stable and then decreases with age, while efforts to maintain social ties (males) and intellectual skills (males) remain constant for all age groups.

The evolution of preparation activities with age may capture either an age effect or a cohort effect. Assuming that they only reflect an age effect, differences between the evolutions of outcomes with age could be due to differences between preparation of the third and of the fourth

age. Indeed, the results show that the likelihood of third-age preparation (captured by physical activity and efforts to maintain intellectual skills) first increases with age and then either becomes stable or decrease. This may mean that individuals first make efforts to compensate for physical and intellectual losses, and then reach their limits. In contrast, for outcomes related to the preparation of the fourth age (like insurance uptake or home adaptation), we find that preparation continuously increases with age, which means that this type of preparation remains important even for older individuals. This difference in the evolution of third- and fourth-age preparation with age is consistent with previous findings for Germany (Kornadt & Rothermund, 2014).

It is also possible that the evolution of preparation with age reflects a cohort effect rather than an age effect: older individuals may prepare more (or less, depending on activities) than younger individuals not because they are older, but because they grew up in a particular period of time and were socialized in a different manner. Longitudinal data are needed to disentangle age effects from cohort effects.